MARINE REVIEW.

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Dullness in Iron Ore Did It.

With the closing weeks of the season of lake navigation, it is plain to be seen that the low rates of freight that have prevailed can be charged to a reduction of about 33 per cent. in the output of iron ore from Lake Superior mines, combined with the surplus of vessel tonnage that has been accumulating for several seasons past. Grain, flour and lumber shipments have shown a steady increase, even into the past month, but the shrinkage in ore, due partly to over production last year, but more largely to depression in the iron market, brought on by threatening tariff legislation, is so large as to be among the most important factors in the situation.

Reports of the freight movement through the St. Mary's Falls canal to Oct. 1 show a decrease, as compared with the same date last year, of 20.8 per cent. in the shipments of iron ore, and it is, of course, well known that the decrease in shipments from Escanaba is proportionately much greater. In fact it is generally admitted that even with the improvement in the ore movement that has taken place since the beginning of September, the total output of the Lake Superior region will barely reach 6,000,000 tons. On the other hand, the canal figures show a gain of 19.8 per cent. in the movement of flour, 27.5 per cent. in corn, 6.7 per cent in wheat and 5.2 per cent. in lumber. But iron ore is the greatest freight commodity and the percentage of decrease, which represents tons instead of barrels or bushels, is a big loss. Following is a summary of the canal statistics:

ST. MARY'S FALLS CANAL TRAFFIC.

	To Oct. 1, 1893.	To Oct. 1, 1892.	Per cent. of increase or decrease in 1893.
Freight of all kinds, net tons	8,097,471	8,824,168	8.2 decrease.
Coal, hard and soft, net tons	2,296,142	2,335,912	1.7 decrease.
Iron ore, net tons	3,188,187	4,027,424	20.8 decrease.
Flour, barrels	4,738,380	3,810,222	19.8 increase.
Corn, bushels.	1,889,594	1,370,982	27.5 increase.
Wheat, bushels	30,535,481	28,476,245	6.7 increase.
Lumber, M. feet	409,712	388,147	5.2 increase.

During September of this year the aggregate movement of freight of all kinds was 1,404,183 net tons, divided as follows:

	East-bound.	West-bound.
Coal	.....	374,339 tons.
Flour	1,019,786 bbls.	.....
Grain	.....	3,600 bu.
Corn	381,356 bu.	.....
Wheat	4,514,463 bu.	.....
Building stone	2,129 tons.	.....
Copper	10,045 tons.	.....
Manufactured iron	.....	2,806 tons.
Iron, ore	571,554 tons.	.....
Iron, pig	9,128 tons.	.....
Salt	.....	19,197 bbls.
Lumber	73,458 M feet.	.....
Silver, ore	820 tons.	.....
Unclassified freight	20,708 tons.	33,620 tons.
Passengers	1,451	1,368

Naval Architects and Marine Engineers.

Secretary W. L. Capps, of the Society of Naval Architects and Marine Engineers, organized a few months ago, announces that the first general meeting of the society will take place in New York city, at 10 a. m., Thursday, Nov. 16. Through the courtesy of the president and managers of the American Society of Mechanical Engineers, the meetings will be held in the rooms of that society, No. 12 West 31st street, the sessions extending through Thursday and Friday, Nov. 16 and 17. It is proposed to have an inaugural banquet on Thursday evening. It is earnestly desired that the inaugural meetings of the society may be fully attended, in order that the papers presented may be discussed with a thoroughness commensurate with their importance. Certificates of membership have been engraved and it is expected that they will be ready for transmission to members within a few days.

The list of papers to be read at the meeting is as follows: "Transatlantic Navigation," Charles H. Cramp, Esq., president Wm. Cramp & Sons' Ship and Engine Building Company, Philadelphia, Pa.; "Steel Ships of the United States Navy," Theodore D. Wilson, ex-chief constructor, U. S. N.; "The Development of Shipbuilding on the Great Lakes," Jno. F. Parkhurst, Esq., vice president and general manager Globe Iron Works Company, Cleveland, O.; "Notes on the Machinery of the New Vessels of the United States Navy," George W. Melville, engineer in chief, U. S. N.; "Coal Bunkers and Coaling Ships," Albert P. Niblack, lieutenant, U. S. N.; "Production in the United States of Heavy Steel Engine, Gun and Armor Forgings," Russell W. Davenport, Esq., vice-president Bethlehem Iron Company, South Bethlehem, Pa.; "Determination of the Approximate Dimensions of a Vessel to Fulfill a Given Programme of Requirements," Joseph J. Woodward, naval constructor, U. S. N.; "Comparative Performances of American and Foreign Freighting Ships—Our Superiority, Wm. W. Bates, Esq., late commissioner of navigation, treasury department; "The Wetted Surface of Ships," David W. Taylor, naval constructor, U. S. N.; "The Influence of Speed and Weight of Machinery on the Determination of the Other Elements of the Design of Steam Vessels," John J. O'Neil, Esq, naval architect and marine engineer; "United States Treasury Rules for the Inspection of Machinery and Boilers," Jas. T. Boyd, Esq., general manager George F. Blake Manufacturing Company. Papers are also expected from the following gentlemen, but the exact titles have not yet been decided upon: Col. Edwin A. Stevens, president Hoboken Ferries; A. Cass Canfield, member America's cup committee, New York Yacht Club; Joseph A. Linnard, naval constructor, U. S. N.

Stocks of Grain at Lake Ports.

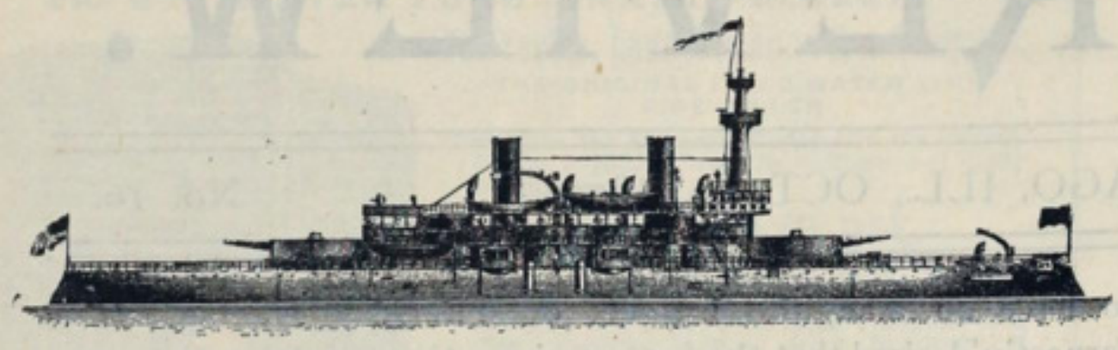
The following table, prepared from reports of the Chicago board of trade, shows the stocks of wheat and corn in store at the principal points of accumulation on the lakes on Oct. 14, 1893:

	Wheat, bu.	Corn, bu.
Chicago	18,942,000	2,734,000
Duluth	3,979,000	.....
Milwaukee	790,000	.....
Detroit	1,116,000	7,000
Toledo	1,784,000	239,000
Buffalo	2,633,000	1,102,000
Total	29,244,000	4,082,000

At the points named there is a net increase for the week of 2,970,000 bushels of wheat and 223,000 bushels of corn.

It is expected that the amount of lumber that will remain on dock this fall at Ashland, Duluth and other ports at the head of Lake Superior will be about the same as last year, but at the opening next spring the lumber available for the eastern trade will be scarce, as the grades most in demand in the east are being shipped about as fast as they are manufactured.

Armored Coast Line Battle Ship Oregon.

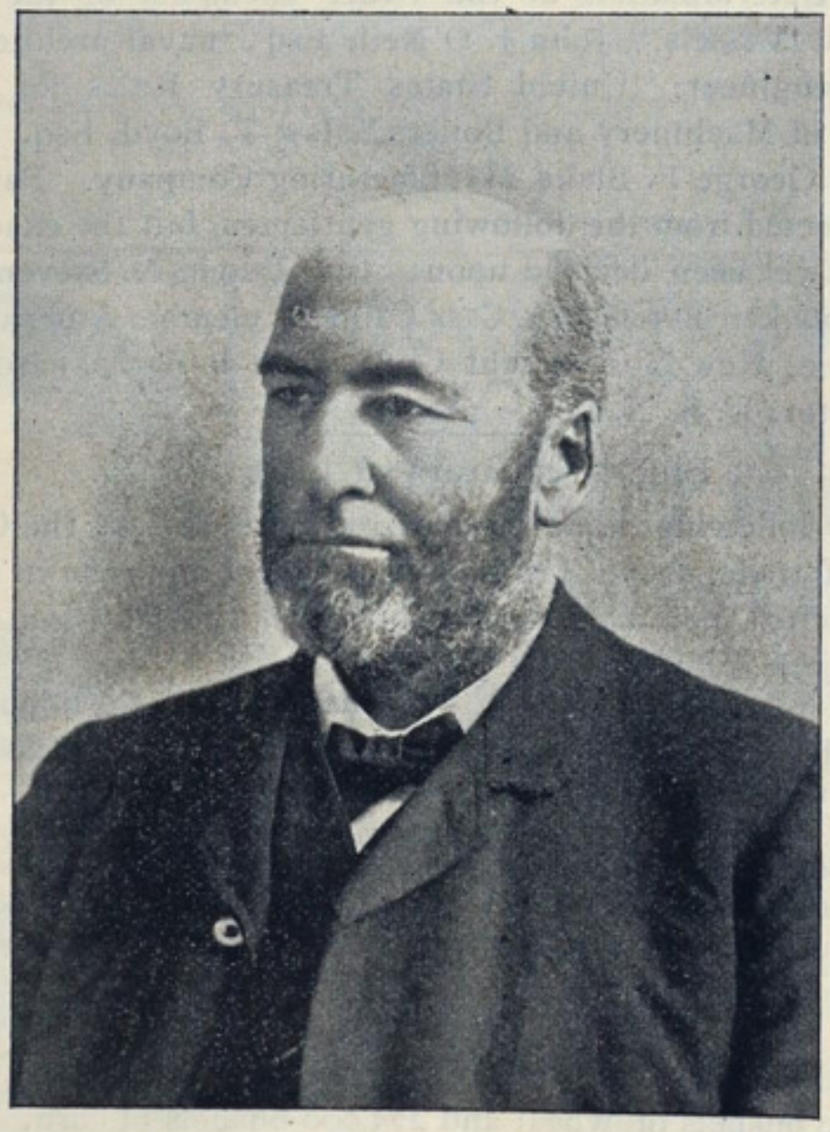


A very neat invitation to the launch of the armored coast line battle ship Oregon has been issued by the builders, the Union Iron Works of San Francisco. The ship will be launched on Thursday the 26th inst., at 11:46 a. m., and the event will be attended by considerable ceremony, but it is, of course, understood that the launching of a vessel of war is very much in advance of her completion. The Oregon's armor will not be delivered until July 1, 1895, and she is not to be completed until Oct. 1, 1895.

A Life of Usefulness.

Brief announcement was made last week of the death of Capt. Thomas Maytham at his home in Buffalo on Sunday, the 8th inst. Besides being manager and principal owner of one of the largest line of harbor tugs on the lakes, Capt. Maytham owned large interests in the steamers Maytham, Brazil, America and schooner H. W. Sage. He had made considerable money in real estate and leaves a large fortune. Born in Lafayette township, Medina county, O., in 1841, he left home at the age of 18 without a cent. He located first in Cleveland, and went to Buffalo several years later. There he engaged in the tug business, which he continued till his death.

The portrait appearing herewith is used through the courtesy of the Illustrated Sunday Express (copyrighted) of Buffalo, which says of Capt. Maytham: "Though never holding political office, he was connected with various societies in which he

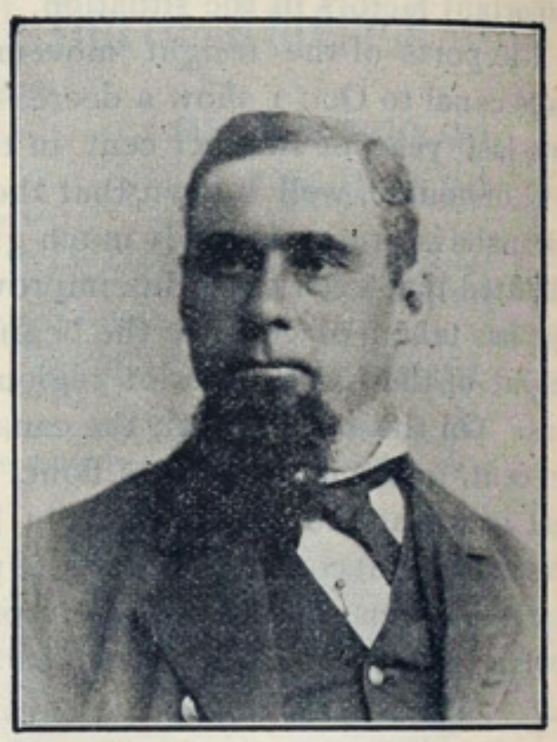


CAPT. THOMAS MAYTHAM.

took a leading position. He was a prominent Mason. Having been one of the founders of the Royal Templars of Temperance he was at first chosen chaplain of the supreme council, and for the last four years had been supreme treasurer. He was a member of the shipmasters' and tug-pilots' association. His uprightness of character was supplemented by a great kindness of heart which extended beyond family relations to every man in his employ and to every man who had passed from his employ to other branches of the marine business or to other callings. And such men as these latter were many, for he not only owned and managed nearly a dozen tugs, but had built in his day a great fleet of them. They will be found not only in all the principal harbors on the lakes, but in New York, Philadelphia, Baltimore and even San Francisco."

The Late Capt. J. F. Smallman.

Capt. J. F. Smallman, whose death was announced from Grand Haven, Mich., on the 10th inst., had crossed Lake Michigan oftener than any of the large number of vessel masters engaged in the passenger service on that lake, and it is said of him that he never lost a passenger during twenty-seven years in command of lake boats. He was born on Prince Edward's island, Gulf of St. Lawrence, August 15, 1837, and went to sea at fifteen. During the war he commanded General Foster's staff boat, the John C. Farron, which plied from New York along the southern coast. It was he who during the hot fighting along the Carolina coast in the early years of the rebellion, landed Lieutenant Cushing when he blew up the iron ram Albemarle, an achievement that won him the thanks of Congress and the rank of lieutenant commander at twenty-one. In those days Capt. Smallman was known as the youngest captain in the volunteer navy. Since 1866 he has been in command of boats on Lake Michigan. The City of Milwaukee, of the Detroit, Grand Haven and Milwaukee line, which he commanded at the time of his death, was brought out by him in 1881.



Lake Freight Matters.

All of the iron mining companies, with the exception of those having their own boats and a few of the new Missabe corporations that have found customers for their ore among their own stockholders, or are trying to make a record, are now practically through with shipments. This does not mean, however, that there will not be, for the balance of the season, enough in the way of straggling shipments to furnish partial employment to vessels in connection with the grain trade, but it is not probable that more unsold ore will be brought down at freights at all in advance of the present figures. As a result there is little hope of high fall freights. Still, grain shipments bid fair to hold out well to the close of the season, and in order to induce vessels to remain in commission after Nov. 1, instead of cancelling insurance and taking advantage of the rebate to be gained for November, there must be some improvement over present freight rates. Both shippers and vessel owners are accordingly expecting a moderate increase in freight charges but no marked advances for the balance of the season.

Langell & Son are said to be preparing to build two wooden vessels at St. Clair, Mich. They are digging a canal from Pine river up into their yards to facilitate business.

A British chart of Lake Superior taking in the entire lake, and giving detail regarding the north shore that is not to be found on United States charts, can be had from the Marine Review for $1.

Mates and Assistant Engineers.

There are many young men in the merchant marine service who are backward about making applications for license as mates or assistant engineers, on account of a fear of inability to withstand examination, and with a view to giving some assistance in this matter the REVIEW has made an effort to secure a list of questions generally put to such applicants. It was not intended, of course, to attempt to publish a list of questions, which, if answered, would guarantee to the applicant a license as either mate or assistant engineer, as this would be impossible.

A letter on the subject from James A. Dumont, supervising inspector general of steam vessels, may be of some value to young men who intend to become marine engineers. He says: "Assistant engineers are required to define steam, vacuum; explain how the latter is formed, how much attainable, why limited; proper examination of engine and boiler before getting up steam; determination of set valves; action required in case of low water in the boilers, when pumps fail to feed, and how to remedy; determine the necessary weight of ball to lever safety-valve, the strain on braces in boilers, to explain the meaning of lead on a valve, and whether there is a difference in lead between the steam and exhaust valves; how to line up an engine; to explain the meaning of "cut off," how to tegulate for different stroke; to give names of different kinds of engines used for marine purposes; explain use of water guages; define horse power; explain difference between condensing and non-condensing engine; explain the use of the salometer; sketch and explain the use of indicator card. In all there are about thirty standard questions, with such others as may occur to the examining inspector, in connection with the particular service the applicant may be engaged in."

In the case of engineers the examination is about the same on the lakes and the coast, and the foregoing will serve for both. Gen. Dumont also gives some information regarding the examination of applicants for licenses as mates of sea going vessels. "For these," he says, "there is a series of about thirty-five questions used, the answers to which are required to be written out by the applicant, and include a definition of latitude and longitude, and method for obtaining the same, both by dead-reckoning and observation; the use of the chronometer, finding course and distance on chart, method of detecting errors in quadrant and sextant, and adjustment of the same; a definition of polar and zenith distance, declination, refraction, equation of time, mean and apparent time, azimuth, and amplitude; and method of finding errors of compass. Besides these are a number questions relating to seaman ship, such as heaving to a steamer in a gale; and with disabled machinery; a discription of fog signals for vessels under weigh and at anchor, lights on steam and sailing vessels, bills of lading, manifests, and method of marking lead and log lines; and, in addition, such other questions in seamanship as the examining inspector may in his discretion deem necessary. The questions to masters are nearly twice as many as those for mates."

On the lakes there is, of course, no necessity of the applicant having any knowledge of matters pertaining to latitude and longitude or the use of instruments applied to the higher standard of scientific methods in salt water navigation, but the finding of course and distance on chart, description of lights and signals, and knowledge of channels, shoals and land marks all enter into examinations here, and an effort will be made to refer to them more fully in a future issue.

Webb's home and academy for ship builder's will be opened this month.

Subscribe for the official report of the Engineering Congress through the Marine Review. Price $10. Sold only on subscription. Must be ordered in advance, to be paid for when delivered.

Steel Ship Construction.

METHOD OF EXPANDING THE STERN PLATING OF A VESSEL AND LAYING OFF THE CANT FRAMES.

Good judgment is necessary in laying off work from the mold loft floor to be completed ready for the ship. The delay of material from the maker is the great evil to contend with in the construction of a metal vessel, each piece being lettered for its respective position, so that a delay of one piece will prevent half a dozen or more being put into place. In the case of the stern, it will effect a considerable saving of time and cost of construction if the whole stern is ready to be put into place after the stern post is erected. No harpins are then needed, which is in itself a saving of material and workmanship, and the job is much better every way.

M T O Y in Fig. 1, represents the sheer plan; M T is the sheer line and O Y the knuckle line. These lines are taken from the plans of the vessel, also the

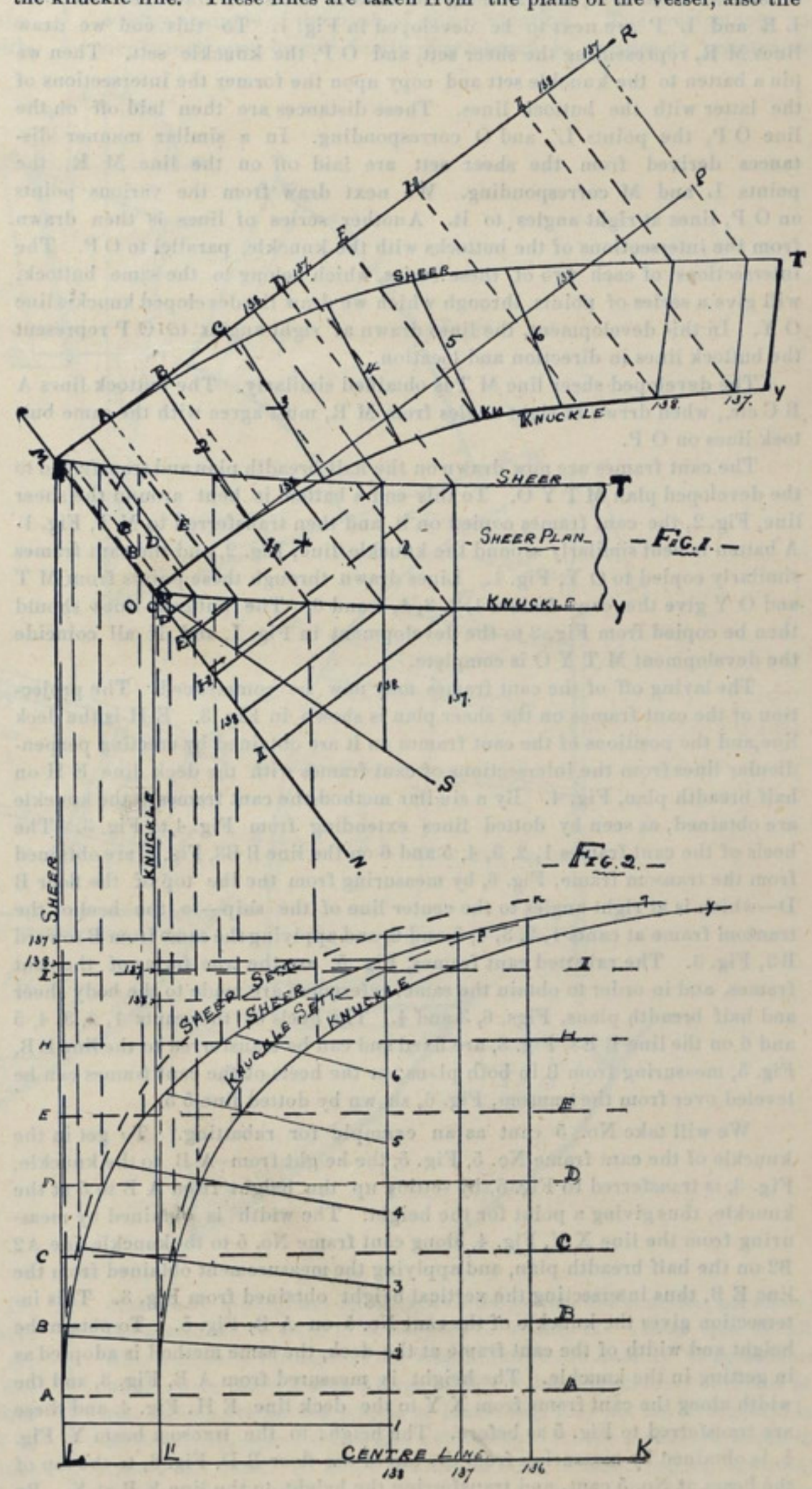


FIG. 1.

FIG. 2.

sheer line L T Fig. 2, which is the half breadth plan. The first thing to be considered is the getting in of the knuckle line O Y, Fig. 1, on the half breadth plan, Fig. 2. To do this, buttock lines A B C D E H and I are put in on the floor, two feet apart, and parallel to the center line L L/K, and where the line L T intersects them, lines are drawn parallel to L M until they intersect the sheer line M T, Fig. 1. Then supposing that the stern is a portion of an oblique cylinder, with the sheer line L T, Fig. 2, for base, and with elements parallel to MO, Fig. 1, we may draw from these points on the sheer, parallel lines to M O until they touch the knuckle line O Y. These lines represent buttock lines on the sheer plan. From the knuckle line O Y, Fig. 1, where the buttock lines touch, lines are let fall till they intersect the similarly numbered buttock lines on the half breadth plan; thus giving points for the knuckle line

L Y. The next line to be considered is the knuckle set L′P, Fig. 2. To obtain this,the line M O, Fig. 1, is produced to N,and from M O N lines are drawn at right angles, intersecting the knuckle line O Y at the buttock lines A B C D E H and I and frame 138. Then we measure along these lines from M O N to O Y, and transfer them to the similarly lettered buttocks in Fig. 2, measuring from L′ O, thus obtaining points from the knuckle sett L′ P; or otherwise we may suppose the line M O N to be hinged at O, and the lines C D E H I and 138, cut at the knuckle line, Fig. 1. Then let these lines from O to N be swung around until O N is on top of L′ O. Then by drawing lines from the cut ends parallel to L′ O till they intersect the similarly lettered buttock lines, the same points will be found as before.

The sheer sett L R, Fig. 2, is obtained similarly to the knuckle sett, remembering to work from the line M O N to the sheer, as shown by the dotted line X, Fig. 1, and when transferring the lengths onto the half breadth plan, to measure from L M, Fig. 2, along the buttock lines and frame intersections. L R and L′ P are next to be developed in Fig. 1. To this end we draw lines M R, representing the sheer sett, and O P, the knuckle sett. Then we pin a batten to the knuckle sett and copy upon the former the intersections of the latter with the buttock lines. These distances are then laid off on the line O P, the points L′ and O corresponding. In a similar manner distances derived from the sheer sett are laid off on the line M R, the points L and M corresponding. We next draw from the various points on O P, lines at right angles to it. Another series of lines is then drawn from the intersections of the buttocks with the knuckle, parallel to O P. The intersections of each two of these series, which belong to the same buttock, will give a series of points, through which we draw the developed knuckle line O Y. In this development, the lines drawn at right angles to O P represent the buttock lines in direction and location.

The developed sheer line M T is obtained similarly. The buttock lines A B C etc., when drrwn at right angles from M R, must agree with the same buttock lines on O P.

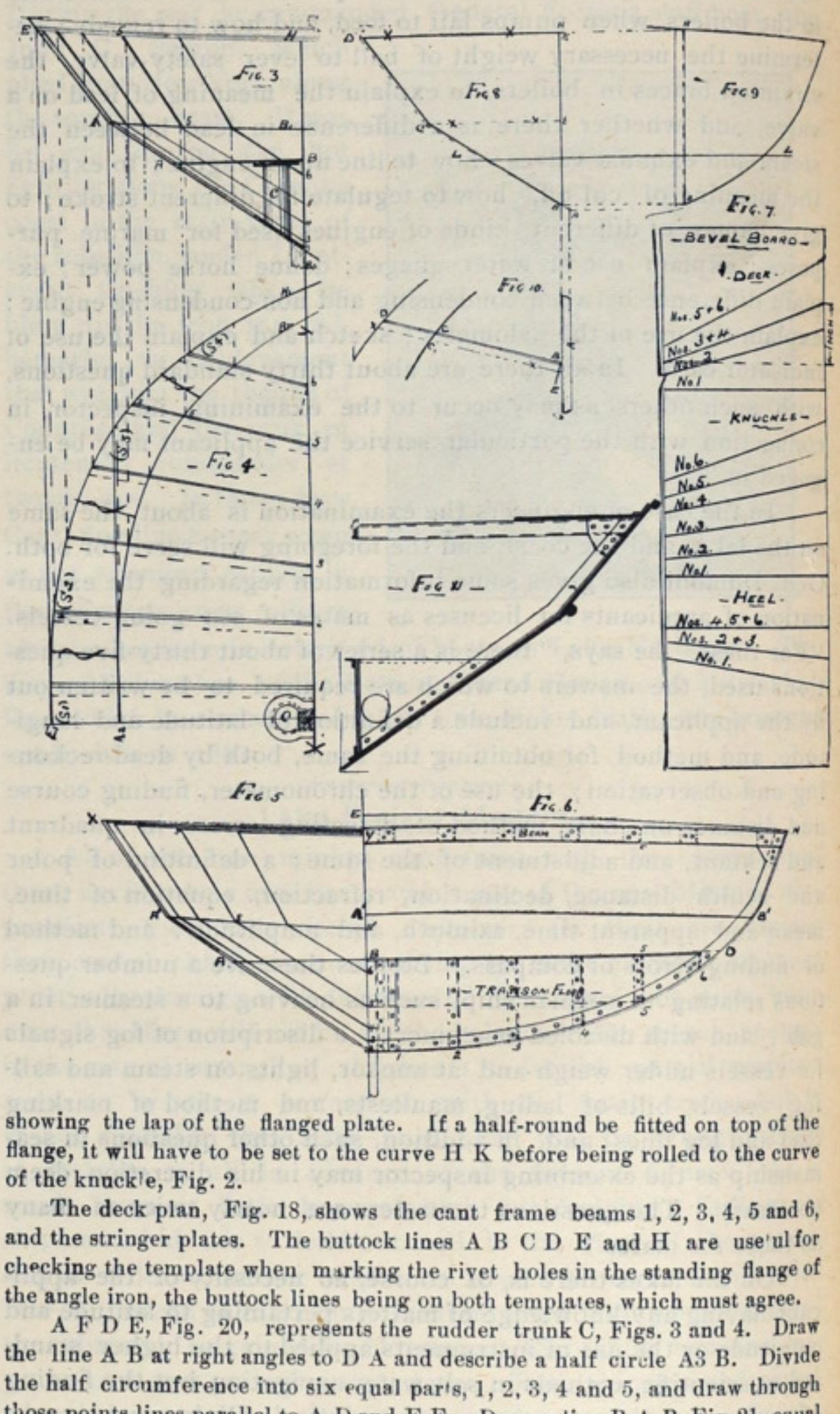
The cant frames are now drawn on the half breadth plan and transferred to the developed plan M T Y O. To this end a batten is bent around the sheer line, Fig. 2, the cant frames copied on it, and then transferred to M T, Fig. 1. A batten is bent similarly around the knuckle line, Fig. 2, and the cant frames similarly copied to O Y, Fig. 1. Lines drawn through these points from M T and O Y give the cant frames 1, 2, 3, 4, 5 and 6. The buttock lines should then be copied from Fig. 2 to the development in Fig. I, and if all coincide the development M T Y O is complete.

The laying off of the cant frames may now be commenced. The projection of the cant frames on the sheer plan is shown in Fig. 3. E H is the deck line,and the positions of the cant frames on it are obtained by erecting perpendicular lines from the intersections of cant frames with the deck line E H on half breadth plan, Fig. 4. By a similar method the cant frames at the knuckle are obtained, as seen by dotted lines extending from Fig. 4 to Fig. 3. The heels of the cant frames 1, 2, 3, 4, 5 and 6 on the line B B3, Fig. 3, are obtained from the transom frame, Fig. 6, by measuring from the the top of the floor B D—which is at right angles to the center line of the ship—to the heel of the transom frame at cants 1, 2, 3, 4, 5 and 6, and applying the same from B toward B 3, Fig. 3. The rabatted cant frames, Fig. 5, are the true forms of the cant frames, and in order to obtain the same, references are made to the body sheer and half breadth plans, Figs. 6, 3 and 4. The heels of the cants 1, 2, 3, 4, 5 and 6 on the line B B3, Fig. 3, are fixed and can be transferred to the line E B, Fig. 5, measuring from B in both plans; or the heels of the cant frames can be leveled over from the transom, Fig. 6, shown by dotted line 5 5.

We will take No. 5 cant as an example for rabatting. To get in the knuckle of the cant frame No. 5, Fig. 5, the height from A B to the knuckle, Fig. 3, is transferred to Fig. 5, by setting up the height from A B to 5 at the knuckle, thus giving a point for the height. The width is obtained by measuring from the line X Y, Fig. 4, along cant frame No. 5 to the knuckle line A2 B2 on the half breadth plan, and applying the measurement obtained from the line E B, thus intersecting the vertical height obtained from Fig. 3. This intersection gives the knuckle of the cant No. 5 on A B, Fig. 5. To obtain the height and width of the cant frame at the deck, the same method is adopted as in getting in the knuckle. The height is measured from A B, Fig. 3, and the width along the cant frame from X Y to the deck line E H, Fig. 4, and these are transferred to Fig. 5 as before. The height to the transom beam Y, Fig. 5, is obtained by measuring from the top of the floor B D, Fig. 6, to the top of the beam at No. 5 cant, and transferring the height to the line E B at Y. By carrying out this process the true form of the cants will be obtained.

Fig. 7 is the bevel board showing the bevels of the cants at the deck, knuckle and heel. These bevels are nearly all open or obtuse angles except Nos. 2 and 3 at the heel, which are shut or acute angles. Figs. 8, 9 and 10 show the method of obtaining these bevels. Fig. 8 is No. 5 cant rebatted, No 9 the body plan, and No. 10 the half breadth plan. The width of the flange. is put in on the half breadth plan X X, Fig. 10, and transferred onto the rabatted cant, Fig. 8. A line, B E, Fig 10, drawn from the point B at right angles to B C D, and from E to C along X X, will give the distance to be measured from H B to C, shown by dotted line E X X, Fig. 8. The bevel at the deck is found similarly to that at the knuckle. To obtain the bevel at the heel of the cant B, Fig. 8, the width of the flange of the cant frame A, Fig. 9, is leveled across to Fig. 8, and the width of the flange of the transom frame A, Fig. 10, is erected until the two lines intersect at A, Fig. 8. The line from C to A will then give the bevel from the knuckle to the heel. The space between the dotted line and the cant frame C D, Fig. 8, is the amount of bevel in the width of the flange. In this case the flange is 3 inches and the difference is 1 inch, so by squaring a line on a 3-inch board and measuring 1 inch at the edge, the bevel will be found by drawing a line from the squared line to the end of the new measurment. See No. 4 bevel, Fig. 7.

Figs. 11, 12, 13, 14, 15 and 16 show the finished cant frames for one side of the vessel, the others being similar. H K M L, Fig, 17, is the development of the stern plating with the connections lined on. Cant frames are numbered 1, 2, 3, 4, 5 and 6. The plates are marked S1, S2, S3 and S4; X the butts; S the letter of the strake of platlng, and A B C D and E are lines put on parallel from the center line H L as a guide for twisting the plates at the rolls. A set is made from the deck line, Fig. 4, for any of these plates, and by putting the plate into the rolls with the lines A B &c. parallel with the rolls, and bending the plate to the sett made from E H, Fig. 4, the plate will have the curve and twist for its place. L M is the sheer line showing a half round fitted to the top. Before rolling the bead to the curve of the sheer, Fig. 2, it should be first set to the curve L M. H K is the knuckle, the dotted line



showing the lap of the flanged plate. If a half-round be fitted on top of the flange, it will have to be set to the curve H K before being rolled to the curve of the knuckle, Fig. 2.

The deck plan, Fig. 18, shows the cant frame beams 1, 2, 3, 4, 5 and 6, and the stringer plates. The buttock lines A B C D E and H are useful for checking the template when marking the rivet holes in the standing flange of the angle iron, the buttock lines being on both templates, which must agree.

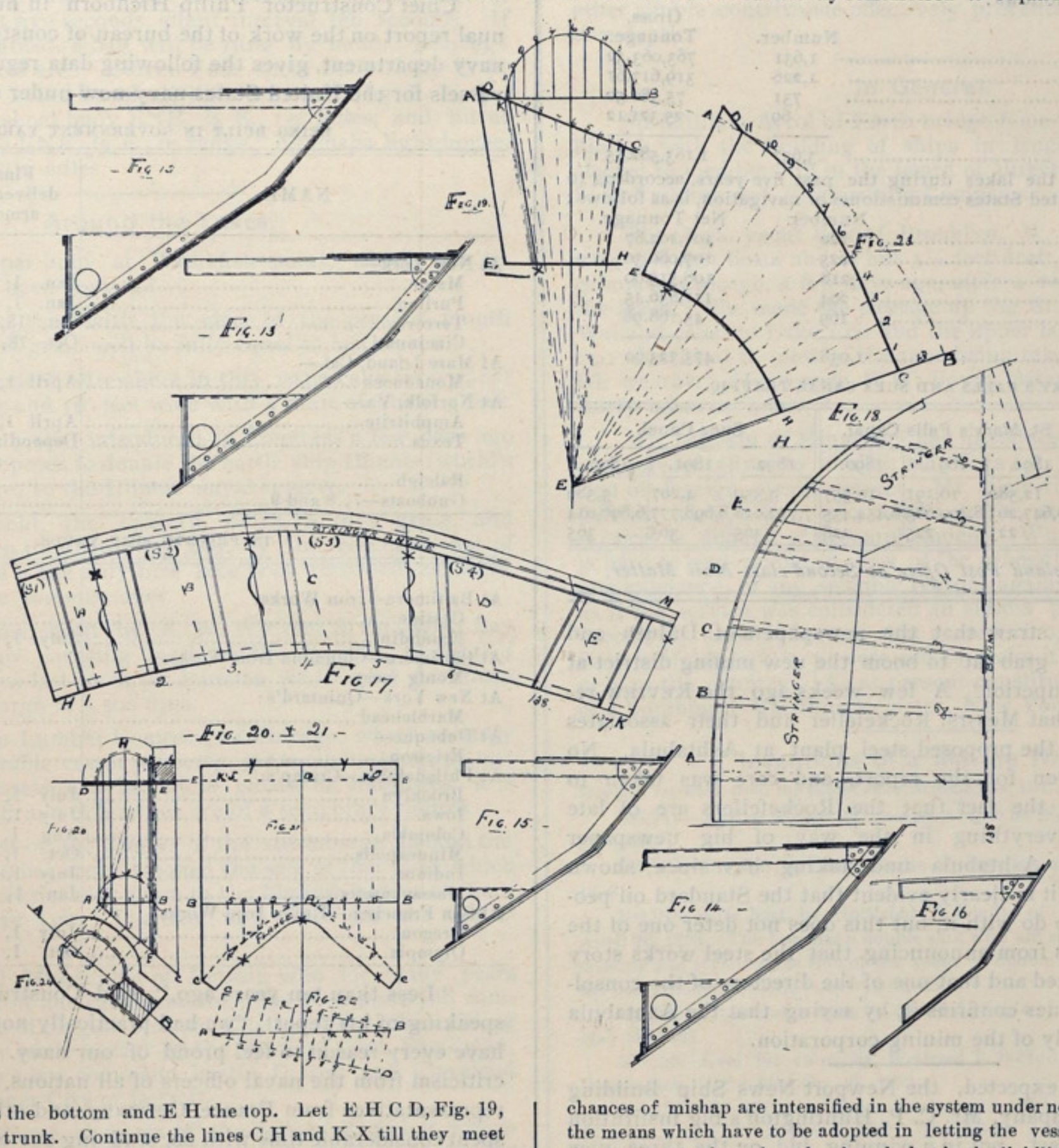
A F D E, Fig. 20, represents the rudder trunk C, Figs. 3 and 4. Draw the line A B at right angles to D A and describe a half circle A3 B. Divide the half circumference into six equal parts, 1, 2, 3, 4 and 5, and draw through those points lines parallel to A D and E F. Draw a line B A B, Fig. 21, equal in length to the circumference of the trunk, and divide it into the same number of equal parts, 1, 2, 3, 4 and 5, from A to B, and from the line A B make 5F, 4 4, 3 3, 2 2 and 1 1 equal to 5′F, 4′4, 3′3, 2′2 and 1′1, Fig. 20. A line traced through these points will then give the line F A F, Fig. 21. It will be noticed that No. 5 line intersects the knuckle of the trunk K, Fig. 20, which accounts for the change of the line from F to C, Fig. 21. The width of the flange K L, Fig. 20, is transferred to Fig 21 at E5 and B5 and drawn to C. The angle 5F C is also transferred to Fig. 21 from Fig. 20. The dotted lines C F A F C, E K D K E and F5 K show where the plate is to be flanged, the lines E B C, X X X and Y Y being the outside of the flanges. This completes the developement of a rudder trunk.

Fig. 24 is the plan of the trunk at bottom, and is found by drawing A B

parallel to A F, Fig. 20, and the lines 1, 2, 3, 4 and 5 at right angles to A B and A F, and by transferring the measurements from A B to 1, 2, 3, 4 and 5, Fig. 20, onto 1, 2, 3, 4 and 5, Fig. 24. A line traced through these points will give the figure shown.

Fig. 22 is a very simple figure and shows a quick method for dividing a line. In applying it to Fig. 20, the trunk is 10 inches diameter and $\frac{3}{8}$-inch thick; then $10\frac{3}{8} \times 3\frac{1}{7} = 32\frac{9}{16}$ inches circumference. This is the length of the line A B, which has to be divided into twelve parts. Through the points A and B draw two parallel lines A D and B C, forming any convenient angle with A B. Upon A D and B C set off the number of equal parts required, as A-1, 1-2, &c., B-1, 1-2, &c. Join B and D, 1 and 11, 2 and 10, &c., cutting A B in X, thus giving a division into twelve equal parts.

In a vessel having a poop deck, the rudder stock is carried above that deck, and the distance from the ground to the hull of the vessel being less than the length of the rudder (including the stock), the rudder must be pulled aft at the bottom until the stock is entered through the hull, thus determining the size of the bottom of the trunk. Fig. 19 shows a trunk fitted into a vessel with a poop deck. C D is the bottom and E H the top. Let E H C D, Fig. 19, represent the rudder trunk. Continue the lines C H and K X till they meet in E. Divide the base of the trunk into twenty-four equal parts, and set them up on the half circle. Then form K B, draw lines meeting 1, 2, 3, &c, at right angles to K B, and from the feet of these pe pendiculars draw another series of lines to E. Next find the development of the base of the trunk K B, Fig. 23, and on it set off the same number of points, viz. 11, and draw lines from E. Then from E as center with the distance E H, Fig. 19, describe E X H, Fig. 23. Transfer the line C, Fig. 19, to Fig. 23, by measuring from E to C, E to 1, E to 2, &c. A line passed through the point thus found in Fig. 23 will give the bottom curve 11 C X E. Fig. 19 is the width of the flange of the trunk, and must be transferred to Fig. 23, also the angle X 11 D, thus completing the half of the section required. The flange must be added to D C and E X H.



Broadside Method of Launching.

It has been a matter of comment for some time past that Englishmen interested in ship building who have visited this country, have been greatly surprised to find that, with few exceptions, the great number of wooden and steel vessels built on the lakes have been launched broadside, instead of sliding stern first into the water. An article printed in 1883 in the Steamship, at that time a journal of authority in British shipping matters, will tend to show the sentiment regarding the broadside method of launching that prevailed on the other side only a few years ago. The article refers to the launching of an iron screw steamer of 225 feet keel after the broadside plan at Sunderland, and the following is a part of the comment included in a report of the event:

"The name of the vessel so unfashionably consigned to her native element by Messrs. Robert Thompson & Sons was the Hoselaw. While the tide was yet a few inches from the ways she was simultaneously set free at all the points at which she had been held, with the result that she thus glided down the ways and 'took the water,' whether 'gracefully,' or whether in a clumsy 'wobbly' manner, is not reported. The broadside system is too expensive, and necessitates too much careful work and management to be voluntarily adopted in preference to the ordinary method. Few, if any, vessels so large have been launched in this way since the Great Eastern, in whose case there is a noteworthy example of the truth of our contention. The misfortunes attending her launch must be sufficiently remembered to require no restatement. The chances of mishap are intensified in the system under notice, not alone through the means which have to be adopted in letting the vessel free at all points simultaneously throughout her length, but in the liability to subsidance of the ways where there is such a large extent of bearing surface. Serious as are the risks which attend this system of launching, they are not so much to be feared as the consequences that might well follow from the manner in which the vessel enters the water. It is the practice to send vessels careering down ways set at an abnormal declivity, and with their outer ends so far from the surface of the water as to gain for this style of launching the Marwoodian phrase of the 'long-drop system.' The treatment which vessels launched in the broadside way receive before they arrive at the ends of the ways quite prepares us for the abuse to which they are often subjected when this stage has been reached. In an inclined position they are tilted over from the ways, the ends of which are often many inches, if not several feet, from the water. We feel bound to say that this matter requires serious looking into, for if vessels launched in the ordinary way are to be so carefully designed and cautiously treated at launching because of possible lurking differences in stability, then broadside launching of vessels without first being assured of their extraordinary stiffness, seems to us a matter charged with the direst possibilities."

MARINE REVIEW.

DEVOTED TO THE LAKE MARINE AND KINDRED INTERESTS.

Published every Thursday at No. 516 Perry-Payne building, Cleveland, O.
Chicago office, (branch), No. 706 Phoenix building.

SUBSCRIPTION—$2.00 per year in advance. Single copies 10 cents each. Convenient binders sent, post paid, 75 cents. Advertising rates on application.

The books of the United States treasury department contain the names of 3,657 vessels, of1,183,582.55 gross tons register in the lake trade. The lakes have more steam vessels of 1,000 to 2,500 tons than the combined ownership of this class of vessels in all other sections of the country. The number of steam vessels of 1,000 to 2,500 tons on the lakes on June 30, 1892, was 321 and their aggregate gross tonnage 534,490.27; in all other parts of the country the number of this class of vessels was,on the same date, 217 and their gross tonnage 321,784.6. The classification of the entire lake fleet is as follows:

Class.	Number.	Gross. Tonnage.
Steam vessels	1,631	763,063.32
Sailing vessels	1,226	319,617.61
Canal boats	731	75,580.50
Barges	69	25,321.12
Total	3,657	1,183,582.55

Tonnage built on the lakes during the past five years, according to the reports of the United States commissioner of navigation, is as follows:

	Number.	Net Tonnage.
1888	222	101,102.87
1889	225	107,080.30
1890	218	108,515.00
1891	204	111,856.45
1892	169	45,168.98
Total	1,038	473,723.60

ST. MARY'S FALLS AND SUEZ CANAL TRAFFIC.

	St. Mary's Falls Canal.			Suez Canal.		
	1892.	1891.	1890.	1892.	1891.	1890.
No. vessel passages	12,580	10,191	10,557	3,559	4,207	3,389
Ton'ge, net regist'd	10,647,203	8,400,685	8,454,435	7,712,028	8,698,777	6,890,014
Days of navigation..	223	225	228	365	365	365

Entered at Cleveland Post Office as Second-class Mail Matter.

IT IS A small straw that the newspapers of Duluth and Superior will not grab at to boom the new mining district at the head of Lake Superior. A few weeks ago the REVIEW referred to a rumor that Messrs. Rockefeller and their associates were interested in the proposed steel plant at Ashtabula. No authority was given for the report, and care was taken to direct attention to the fact that the Rockefellers are of late connected with everything in the way of big newspaper schemes. As the Ashtabula undertaking has since shown signs of weakness, it is clearly evident that the Standard oil people have nothing to do with it, but this does not deter one of the Duluth newspapers from announcing that the steel works story has been investigated and that one of the directors of the consolidated Missabe mines confirms it, by saying that the Ashtabula plant is to be an ally of the mining corporation.

AS HAD been expected, the Newport News Ship Building and Dry Dock Company, Mr. C. P. Huntington's big institution on the Virginia coast, put in a winning bid on the three new gun boats, for which proposals were received by the navy department on Tuesday last. The offer of the Newport News company, $280,000 each for all three of the new boats, is very much below all competitors, and there is no doubt of the ability of the company to get all of the boats out on time at its big ship yard.

THE awful loss of life in the disasters of the past week is most deplorable, and sympathy and aid should be extended on all hands to the unfortunate widows and orphans in all parts of the lakes, but the attempts of sensational newspapers to lay the blame to vessel owners, who have suffered death in their own families, are as rediculous as the remedies suggested.

KRUPP employs 16,000 men, who with their families number 50,000, constituting the bulk of the population of Essen, while over 3,000 are located at various branch works, and the total number benefited by the numerous charitable and philanthrophic enterprises of the firm is estimated at 25,200 workmen, and, with their families, 87,900 persons.

PACIFIC coast representatives in Washington are again bringing up canal schemes that were talked of in the last Congress. Representative Wilson of Washington, has introduced a bill (H. R. 3,985) making an appropriation for the construction of a ship-canal connecting Lakes Union and Washington with Puget sound. The measure has been referred to the committee on commerce.

Work on Twenty-Four Naval Vessels.

Chief Constructor Philip Hichborn in his forthcoming annual report on the work of the bureau of construction and repair, navy department, gives the following data regarding twenty-four vessels for the United States navy now under construction:

BEING BUILT IN GOVERNMENT YARDS.

NAME.	Final delivery of armor.	Date of completion.
At New York—		
Maine	Jan. 1, 1894.	Sept. 1, 1894.
Puritan	Jan. 1, 1894.	July 1, 1894.
Terror	Oct. 13, 1893.	Feb. 15, 1894.
Cincinnati	Oct. 13, 1893.	Jan. 15, 1894.
At Mare Island, Cal.—		
Monadnock	April 1, 1894.	Aug. 1, 1894.
At Norfolk, Va.—		
Amphitrite	April 1, 1894.	Aug. 1, 1894.
Texas	Depending on armor.	June 30, 1894.
Raleigh		Nov. 1, 1893.
Gunboats—7, 8 and 9		Nov. 1, 1895.

IN PRIVATE SHIP YARDS.

At Baltimore—Iron Works:		
Castine		Sept. 30, 1893.
Katahdin	July 1, 1894.	April 1, 1893.
At Baltimore—Columbia Iron Works:		
Montg mery		Nov. 1, 1893.
At New York—Quintard's:		
Marblehead		Dec. 30, 1893.
At Dubuque—		
Ericsson		June 30, 1894.
At Philadelphia—Cramp's:		
Brooklyn	July 1, 1895.	July 1, 1896.
Iowa	July 1, 1896.	Oct. 1, 1896.
Columbia	Aug. 1, 1893.	Feb. 1, 1894.
Minneapolis	Oct. 1, 1893.	Aug. 1, 1894.
Indiana	July 1, 1894.	Oct. 1, 1894.
Massachusetts	Jan. 1, 1895.	April 1, 1894.
At San Francisco—Union Iron Works:		
Oregon	July 1, 1895.	Oct. 1, 1895.
Olympia	Oct. 1, 1893.	Dec. 1, 1893.

"Less than ten years ago," said Constructor Hichborn in speaking of his report, "we had practically nothing, but now we have every reason to feel proud of our navy. We have invited criticism from the naval officers of all nations, and distingui hed representatives from France, Germany, and other countries have spent considerable time with us, studying our work. This is one explanation of our rapid advance. In European naval establishments everything is secret; in fact, it is considered treason to give out any information. It is the reverse with us. We let the world know what we are doing. We invite criticism, and when they discover anything wrong they are quick to agitate it. So we have the best of other nations and profit by their criticisms."

A light-house to be erected on Penmarch point, Brittany, will contain a "lightning flash" light of 40,000,000 candle power, casting a beam which can be seen in clear weather sixty-three miles away and in foggy weather twenty-one miles. This is by far the most powerful, searching and penetrating light known to sc ence. It will cost about $60,000, and will be known as the Eckmuhl light-house.

Eleven-Foot Shoal Light-Ship.

Masters of vessels trading to Escanaba will be especially interested in the new light-ship, No. 60, which is moored in the northern end of Green bay in about 60 feet of water, off the southward and westward of Corona and Eleven-Foot shoals. The vessel shows simultaneously from three lens lanterns encircling the foremast head a fixed white light. The focal plane of the light is 40 feet above lake level, and the light may be seen in clear weather, the observer's eye 15 feet above the same level, 13½ miles. The vessel has two masts, schooner rigged, and no bowsprit. There is a circular black cagework day mark at the foremast head and a small white smokestack and the fog signal between the masts. The hull is black, with "eleven-foot shoal" in large white letters on each side and "No. 60" on each bow. During thick or foggy weather a 6-inch steam whistle sounds blasts of five seconds' duration, separated by silent intervals of ten seconds, thus: Blast five seconds, silent interval ten seconds; blast five seconds, silent interval ten seconds. If the whistle be disabled, a bell will be rung by hand. Bearings of prominent objects are: Eleven-Foot shoal buoy N. by E. ⅝ E., 1¾ miles, and Point Pennisala light-house N. by E. ⅝ E., in range; Corona shoal buoy ENE. ⅛ E., 1¾ miles, and Burnt Bluff (left tangent) ENE. ⅛ E., in range; Escanaba light-house, N. by W. ¼ W., 9½ miles.

Around the Lakes.

The 24-foot spar buoy at Whitefish point, which was reported adrift, has been replaced.

It is probable that with the close of the present month Buffalo's receipts of grain will be fully equal to last season.

An advertisement el-ewhere in this issue calls for a yacht about 50 feet long and 16 feet wide with a draft of about 3 feet.

A bill (H. R. 3,982) introduced in Congress a few days ago by Mr. Aldrich proposes to donate the battle ship Illinois (world's fair brick structure) to the Illinois naval reserve.

A Chicago yacht, the Taxteth, of 23.78 tons gross, and 22.59 net, has been numbered 145,655 by the commissioner of navigation. This is the only new lake boat recorded last week in the office of the commissioner.

The Keweenaw, built by F. W. Wheeler & Co., West Bay City, Mich., is now carrying mail on the Pacific. She sailed from San Francisco last week for Panama via Central American ports, having a cargo of 3,500 tons.

The Ketcham Lumber Company of Chicago, which recently acquired considerable vessel property, made an assignment last week. As the assets are largely in excess of liabilities, it is thought that the firm's difficulties are of a temporary nature.

At the request of the owners of the steambarge Leland the United States marshal has postponed the sale of that boat, which was to have been knocked down to the highest bidder at Sandusky on Tuesday last. The date now fixed for the sale is Tuesday, Oct. 24.

Capt. Dugald McLachlan of Detroit, who for many years sailed in the Detroit and Cleveland line, has been placed in command of the Lake Michigan steamer City of Milwaukee, filling the place recently made vacant by the death of Capt. Smallman. Capt. McLachlan's last command in the Detroit and Cleveland line was the steamer City of Detroit.

Rev. E. R. Pierce, chaplain of the Sailors' Bethel at Chicago, has received permission from the war department to use the south pier at Chicago for a place to build a "snug harbor" for old and disabled seamen. The only stipulation in the grant is that the pier must be kept in good repair. It is planned to lengthen the pier enough to put a sufficient distance between the sailors' home and the life-saving station, so as not to interfere with the operations of the latter.

Details of the Holland Submarine Boat.

The Holland design for a submarine vessel, recommended by a board of naval officers, proposes a boat of about 140 tons displacement, 80 feet long and 11 feet in diameter. It is provided with two sets of quadruple expansion engines and a water tube boiler capable of developing 1,000 indicated horse power. The steam power is employed only for propulsion on the surface of the water, and for a few moments after diving. The propelling power while submerged, is afforded by storage batteries and a dynamo developing 70 effective horse power. The surface speed will be about 16 knots per hour, and the speed while submerged 8 knots. Interesting features of the proposed vessel will be its rapidity of action—diving and rising when required as rapidly as a porpoise; its ability to run near the surface, having the body of the vessel protected against shot by a depth of three feet of water, while the turret, armored with eight inches of nickel steel, projects above the surface to protect the pilot. The vessel can dive from this condition in ten seconds, and submerge itself to a depth of 20 feet, thus going beyond the reach of attack. While submerged there is no uncertainty as to the course steered. An automatic apparatus, substituted for the mariner's compass that has proved useless in similar cases, directs the course of the vessel infallibly without requiring the pilot's attention. A peculiar arrangement of special devices prevents any change of the total weight of the boat while in action, in order that the power of driving rapidly may remain always unimpaired. Another simple contrivance effectively prevents a dive to an excessive depth.

In General.

Sir William Arrol of Forth bridge fame is about to identify himself with the building of ships in England. He has been elected to membership in the board of directors of the Fairfield Ship Building and Engineering Company.

The steam yacht Rex of Brooklyn, N. Y., a boat 65 feet long, 7½ feet beam and of but 3½ feet draft, arrived at the fair grounds, Chicago, a few days ago, after a rough experience on the lakes. She made the passage up the St. Lawrence and the Welland canal to Lake Erie and the upper lakes, but spent about two months at it, most of the time being taken up in waiting for fair weather. Her owner, F. W. Boyer, claims she can run about thirty miles an hour.

Mr. Baldwin of Minnesota has introduced a bill in the House of Representatives to abolish all offices for the seperate inspection of foreign steam vessels. Mr. Baldwin has undertaken a difficult task. Any reformation in the steamboat inspection service is difficult of accomplishment. Why this should be so is hard to understand in view of the necessity of reform and the non-existence of any sensible reasons against it. But it seems as if the service was considered an almost perfect body, or that it controls some influence that protects it aaingt all efforts to strip it of dangerous powers and to make it of far more usefulness to the country. As at present constituted it is a good deal of a humbug.—Maritime Register, New York.

Inventions of a Marine Nature.

Specially reported from the patent office, Washington, D. C., for the MARINE REVIEW.

505,941—Marine boiler, by Joseph A. Eno of Newark, N. J.; filed Jan. 31, 1893.

505,974—Dredger, by James Canan of Owen Sound, Canada; filed Feb. 3, 1893.

506,048—Life boat, by Gottfried F. Klaflky of New York, N. Y.; filed April 20, 1893. The boat has a double skin with air space between, both skins meeting and forming one side of the keel. A double floor is also attached to the boat, the latter being buoyed with air.

506,076—Hatchway ladder, by James J. Nagle of Milwaukee, Wis.; filed May 18, 1893.

506,139—Keel for ships, by Walfreid T. Steven and Geo. W. Coffin of Washington, D. C.; filed Oct. 28, 1893.

506,150—Signalling between vessels upon water, by Lucian I. Blake of Lawrence, Kan.; filed Oct. 1, 1889. The device is for a system of telephony, as it were, the water being however the medium for vibrating the phonic diaphrams.

Copies of specifications accompanying these patents can be had at 15 cents each upon application to the MARINE REVIEW, 516 Perry-Payne building, Cleveland, O.

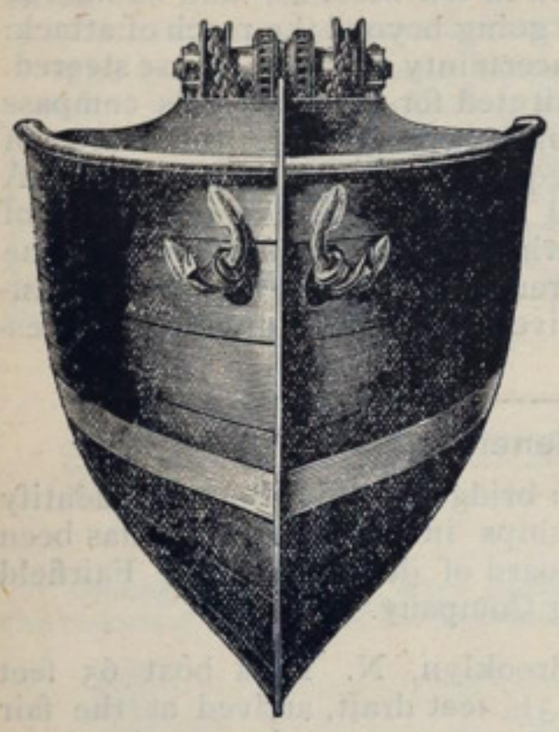
FIFTEEN PHOTOTYPES OF THE LATEST LAKE STEAMERS AND A PICTURE OF THE GREAT EASTERN, NEATLY BOUND, FOR 50 CENTS. WRITE THE MARINE REVIEW, NO. 516 PERRY-PAYNE BUILDING, CLEVELAND, O.

TIME FLIES—And if you don't look out you may fail to see the world's fair. The best opportunities yet afforded will be the Nickel Plate road's daily one-fare excursions, commencing Oct. 19th.

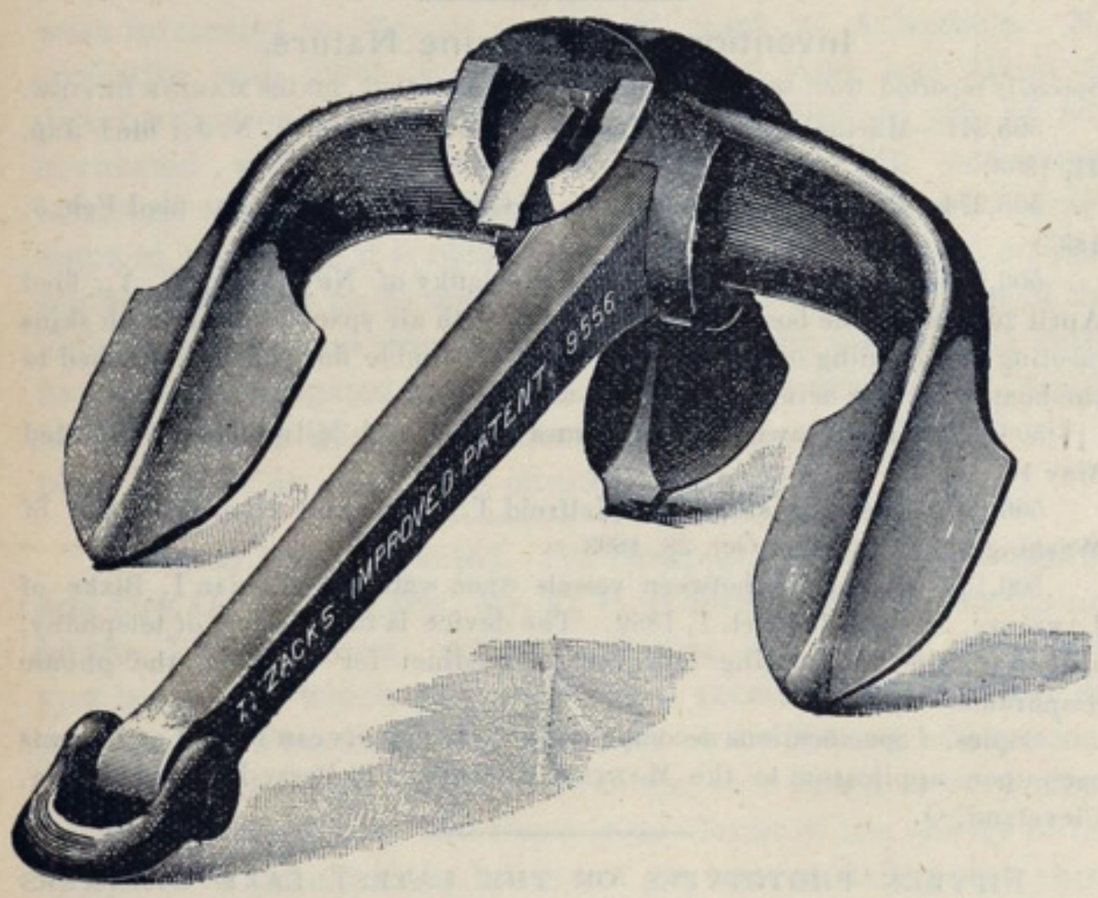
WORLD'S FAIR EXCURSIONS—Will be run every day commencing Oct. 19th via the popular Nickel Plate road.

Triple Grip Stockless Anchors.

There is a little doubt that in this country, as elsewhere, new vessels of both the naval and merchant service will soon be equipped with stockless anchors. On the lakes only one vessel, the new steel steamer Alva, of the Bradley fleet, built by the Cleveland Ship Building Company, has as yet been fitted with anchors of this type, but as the owners and the master of this vessel express great satisfacion with the anchor, it is more than probable that other new vessels will be similarly equipped. Nearly all new vessels built in Great Britain during the past two or three years have been fitted with stockless anchors and if owners had not become thoroughly convinced of their value and desirability over the old fashioned kind they certainly would not have been adopted as they have been. These anchors have also been extensively adopted by the English, French and Italian governments, and on account of their advantages ship owners are invariably specifying them in contracts for new vessels. As they are stowed in the hawsepipes of steamers, all catting and fishing is dispensed with, and in letting go, all that is necessary is to slacken the compressor.



DeGrauw, Aymar & Co. of New York, a firm well known to shipping interests on the lakes, as well as all parts of the coast, have anticipated the demand for anchors of this kind, and recently completed arrangements with George Tyzack of South Shields, England, to become in the United States the agents for his make of stockless anchors. As there are several descriptions of the anchors in the market, this firm has been for several months very carefully investigating their respective merits, and after a very thorough inquiry they are of the opinion that the Tyzack triple grip stockless anchor is equal in quality and merit to any make, while the cost, which has been a draw-back to sales, is considerably less than that of some other makes. Mr. Tyzack also manufactures a cheaper pattern than the triple grip, known as the Vulcan, which will be offered to buyers requiring a cheaper article. The additional third central arm in



the Tyzack anchor, shown in engravings herewith, works at the same angle and upon the same axis as the lateral arms, and is designed to steady the action of the anchor. Two-armed stockless anchors are not as desirable as those of the triple grip kind, as they roll over, it is claimed, and turn themselves out of the ground, losing their hold when a heavy strain comes upon them. The reason of this defect is traced in the fact that the strain from the cable through the anchor shank does not come in a direct line upon the lateral arms of the anchor, but is a cross strain, and unless each arm finds exactly the same bearing (which is practically impossible in ordinary holding ground) the drag upon the anchor becomes a one-sided strain with the inevitable result that the anchor loses its grip. The Tyzack anchors have been approved by Lloyds and are in use on many leading lines of transatlantic, East Indian and Australian steamers.

Lake Superior Ore Shipments.

Shipments of iron ore from Two Harbors up to and including Wednesday, Oct. 11, aggregated 788,895 gross tons and were divided as follows: Chandler, 384,030 tons; Minnesota, 327,222; Zenith, 12,998; Cincinnati, 9,939; Canton, 24,412; Franklin, 28,110; Hale, 2,176. Shipments of Gogebic range mines through Ashland up to and including Saturday, Oct. 7, foot up 1,007,106 tons, divided among the different mines as follows: Ashland, 27,760 tons; Aurora, 149,587; Colby No. 2, 45,615; Tilden, 116,343; Germania, 4,975; Iron Belt, 17,625; Montreal, south vein, 2,606; Montreal, north vein, 28,803; Eureka, A, 1,949; Brotherton, 14,643; Comet, 5,035; Eureka, 24,166; Careys, 44,214; Newport, 100,715; Norrie, 228,476; East Norrie, 78,135; Palms, 1,984; Pabst, 91,891; Jack Pot, 1,651; Davis, 13,282; Sunday Lake, 19,344.

Trade Notes.

The gigantic hydraulic forging press of the Bethlehem Iron Company at South Bethlehem, Pa., was started off the 7th inst. The press has been erected in an extension to the building of the famous 125-ton steam hammer.

The Bethlehem Iron Company shipped, a few days ago, sixty-four tons of plate for the battle ship Maine to the national proving grounds at Washington. The plates are 8x15 feet, and 12 inches thick. These plates are the first service plates that have been Harveyized, and their trial will consequently be of interest.

The American Shipmasters' Association, publishers of the Record of American and Foreign Shipping, classed last week the barge C. R. R. of N. J. No. 12, ship City of Montreal and three-masted schooners Harold J. McCarthy and William H. Skinner, all American; also the British schooner Edward Blake, British bark Violet and Spanish barges San Fernando and Tinima.

The New Home Sewing Machine Company of Orange, Mass., has placed a contract with the Berlin Iron Bridge Company of East Berlin, Conn., for a new foundry and tumbling room. The building will be entirely of iron, 45 feet in width and 120 feet in length. The Berlin company has also been awarded the contract for the new draw bridge at Salem, Mass. The bridge will have a 60-foot opening with a roadway 28 feet wide in the clear and two sidewalks, each 6 feet wide. It will be of deck plate girder construction.

Among the wooden vessels building on the coast, and referred to in the last issue of the American Ship Builder of New York, are the following: Four-masted schooner of 162½ feet keel, by Capt. J. W. Sawyer of Milbridge, Me.; 900-ton barkentine, by McDonald & Brown of Belfast, Me., for C. Morton Stewart & Co. of Baltimore, Md.; small passenger propeller, by S. H. Barbour of Brewer, Me., for Connor Bros. of Bar Harbor, Me.; 1000-ton, four-masted schooner, by McDonald & Anderson of New London, Conn., for Capt. Thomas Mehaffy; three-masted schooner, by Kelley, Spear & Co. of Bath, Me., for H. L. Crammer of Jersey City, N. J.

Southampton and Queenstown are the names selected for the two American line ships, building at Cramp's.

WANTED---YACHT

Length on Deck	50 Feet.
Width	16 "
Depth	6 "
Draft not over	3 "

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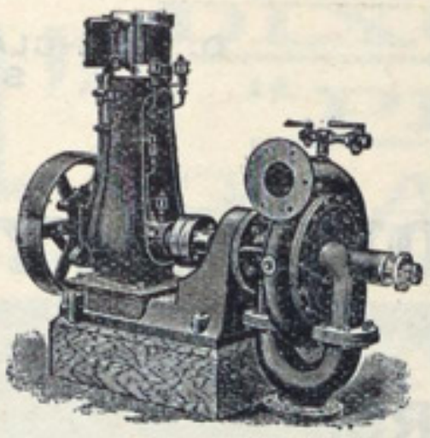

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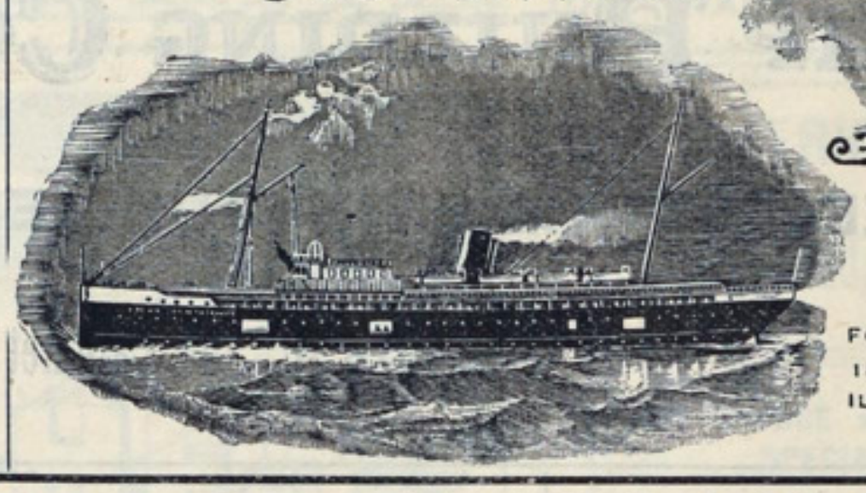

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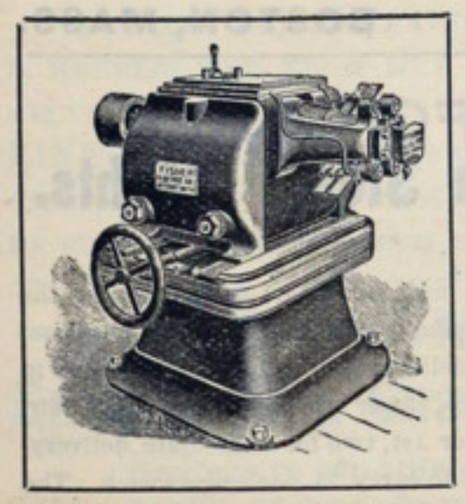

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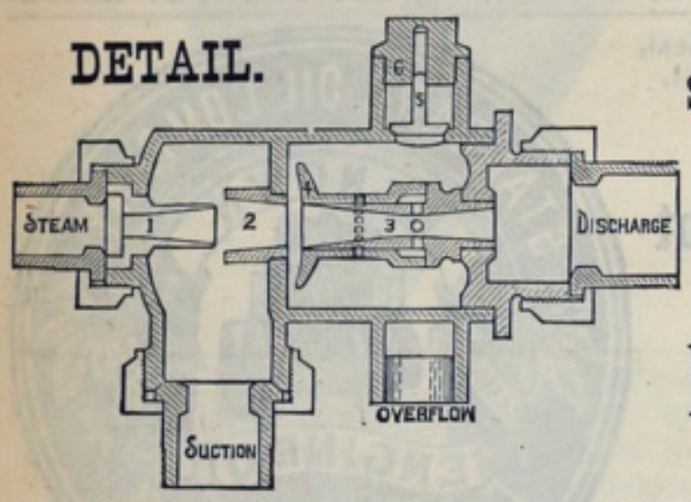

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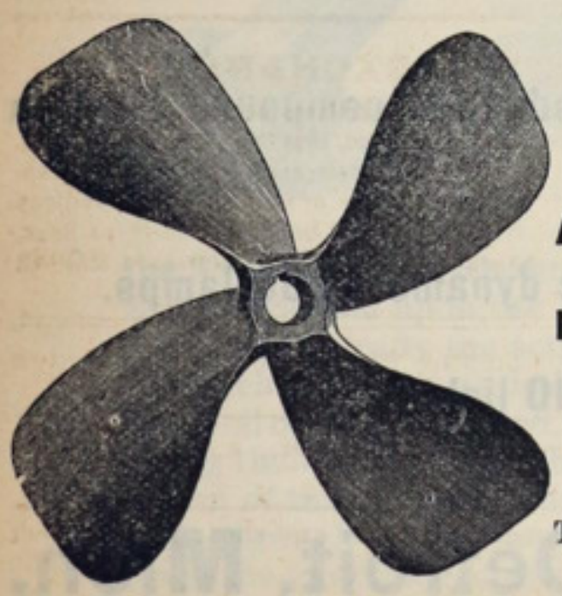

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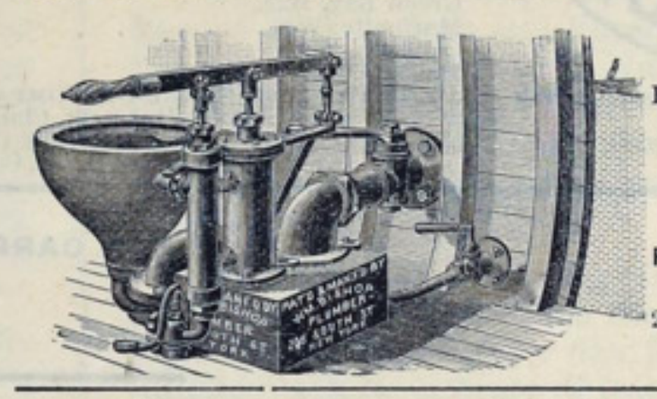

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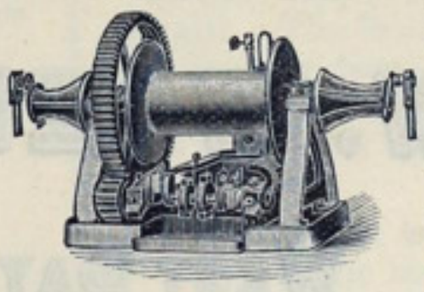

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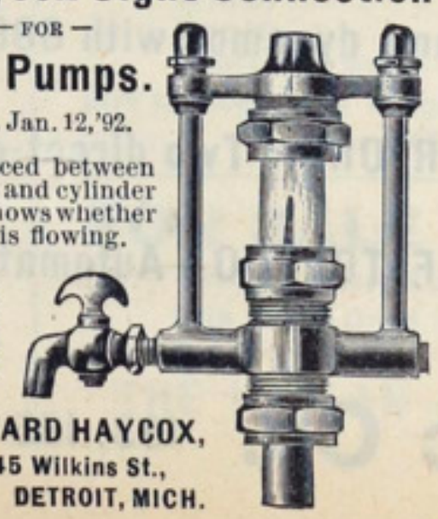

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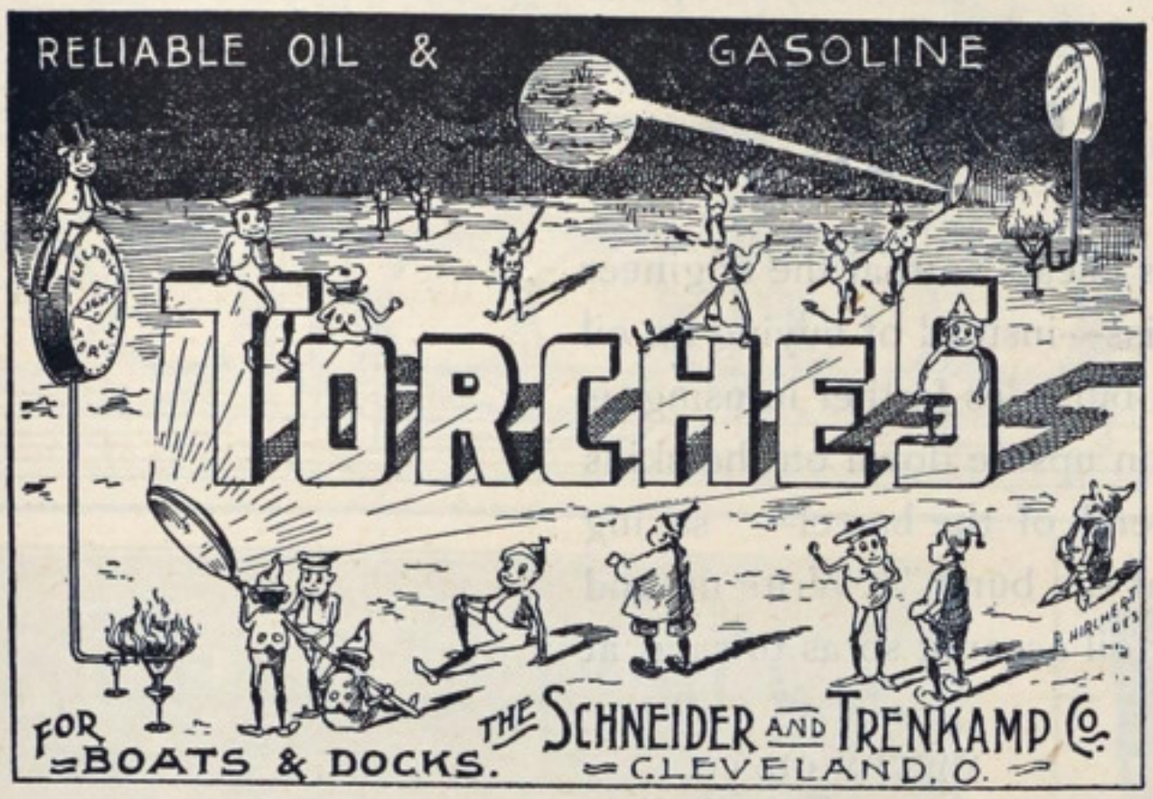

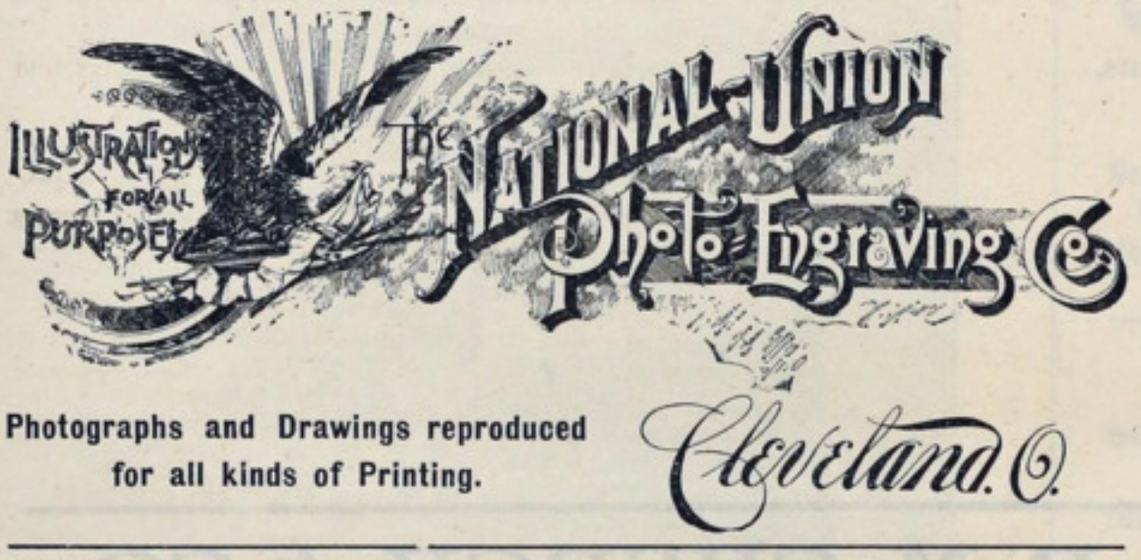

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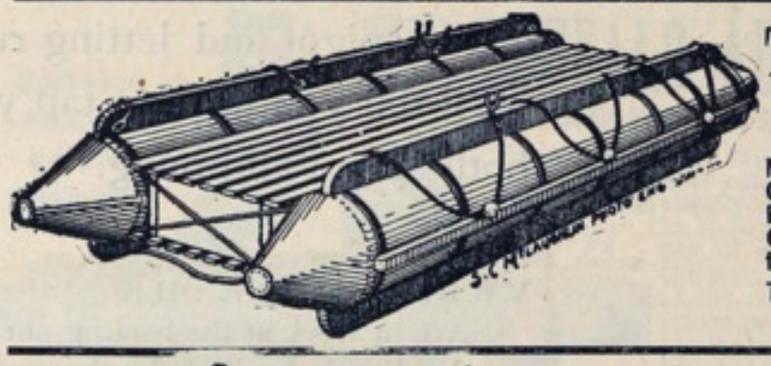

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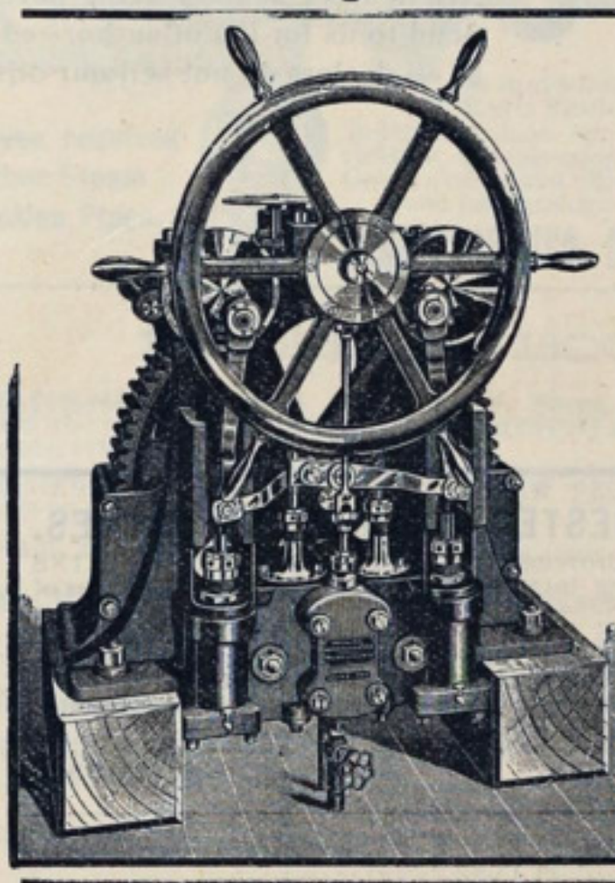

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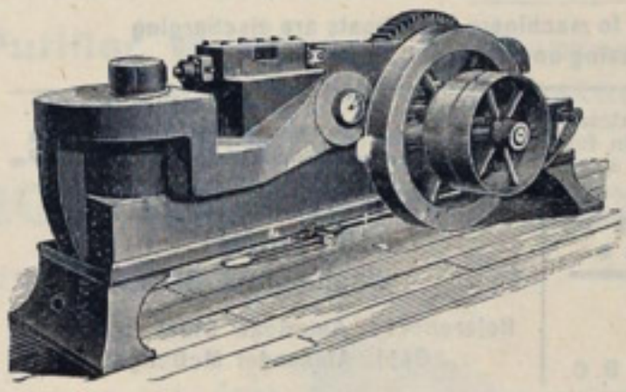

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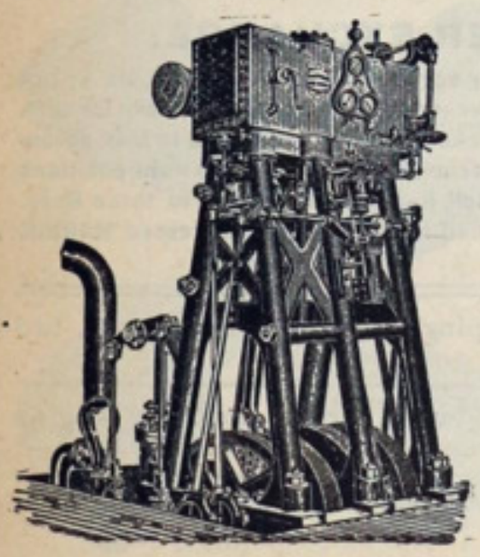

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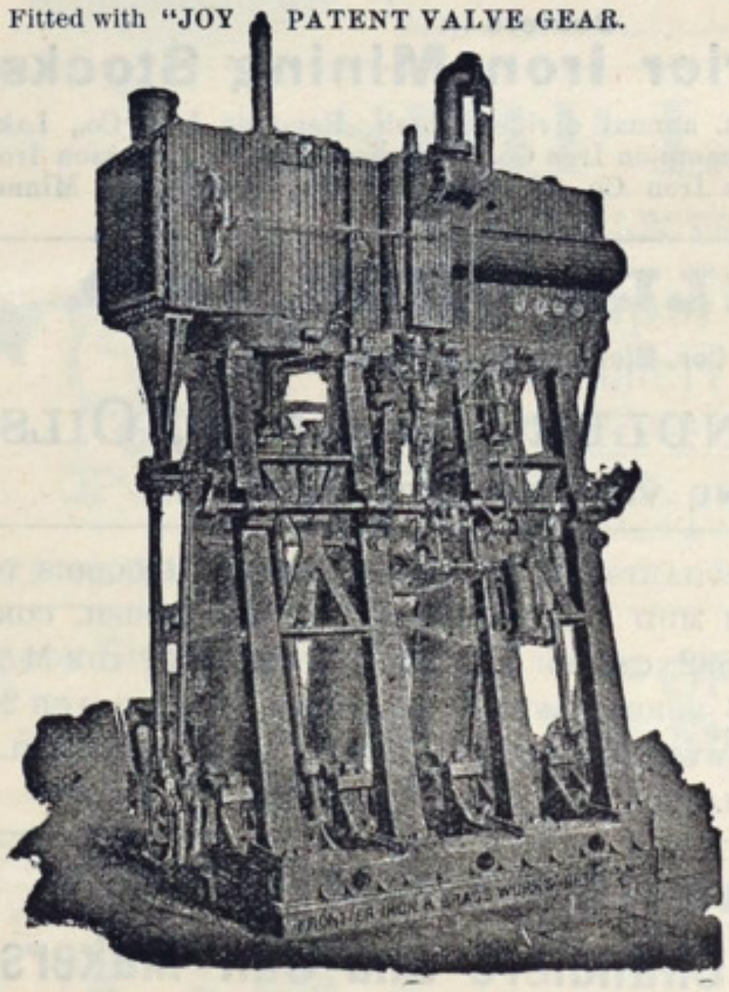

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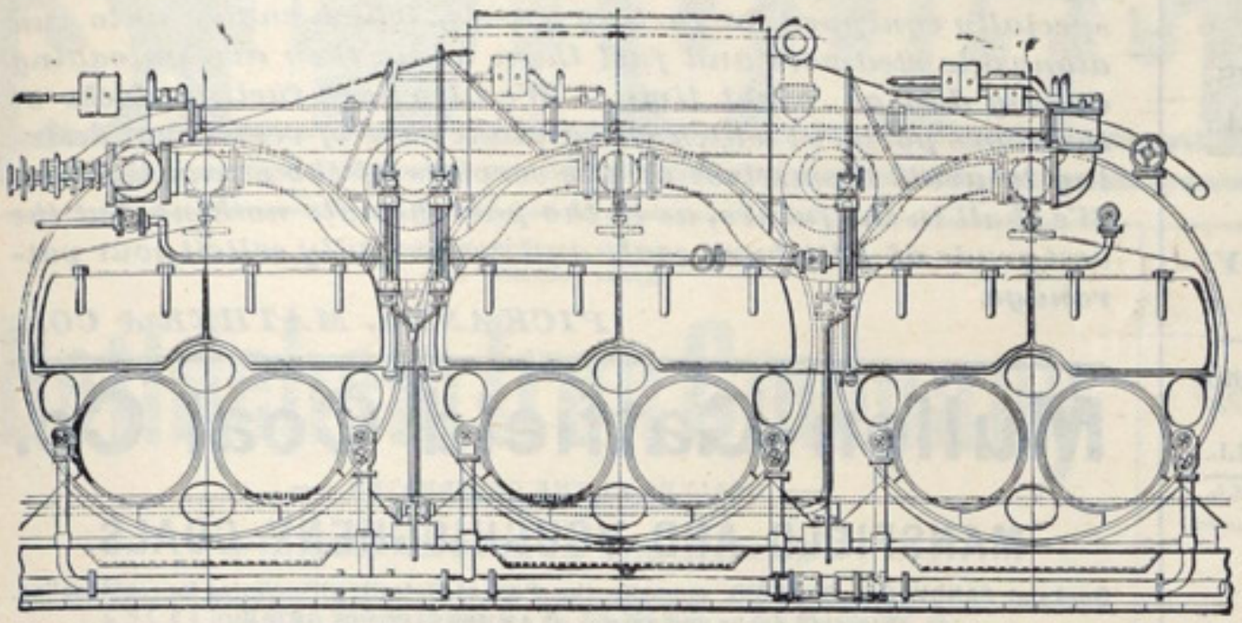

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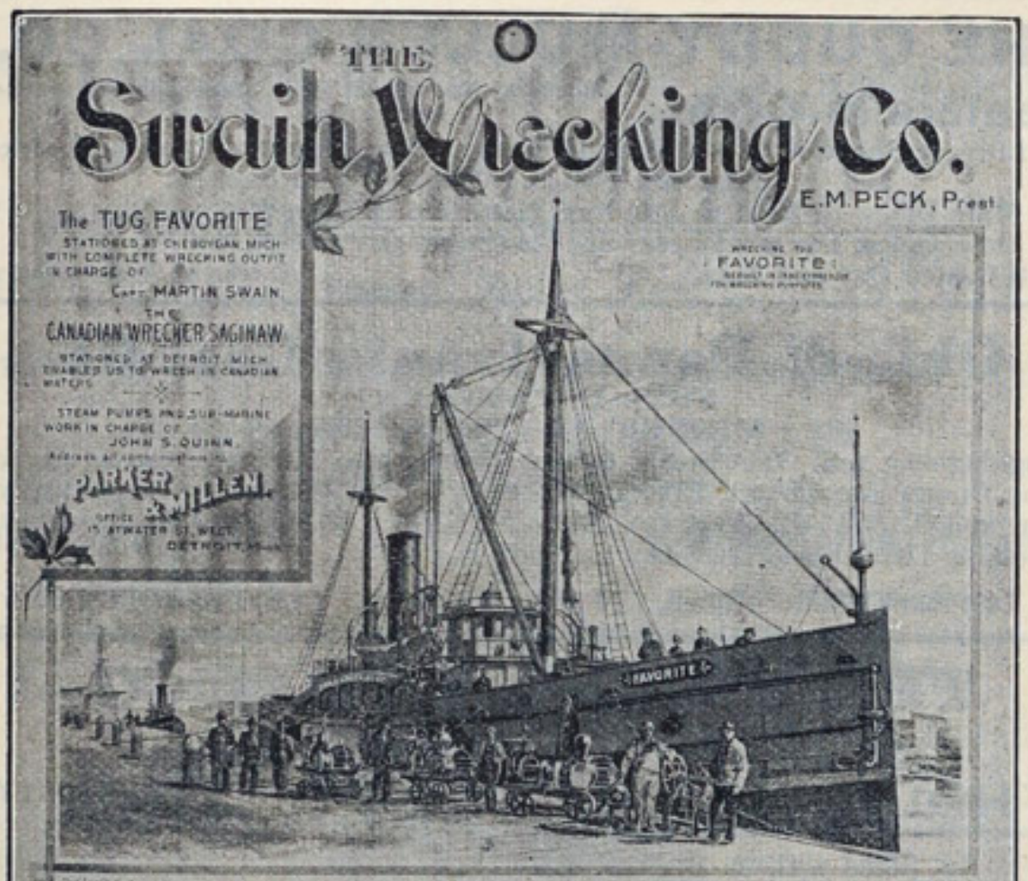

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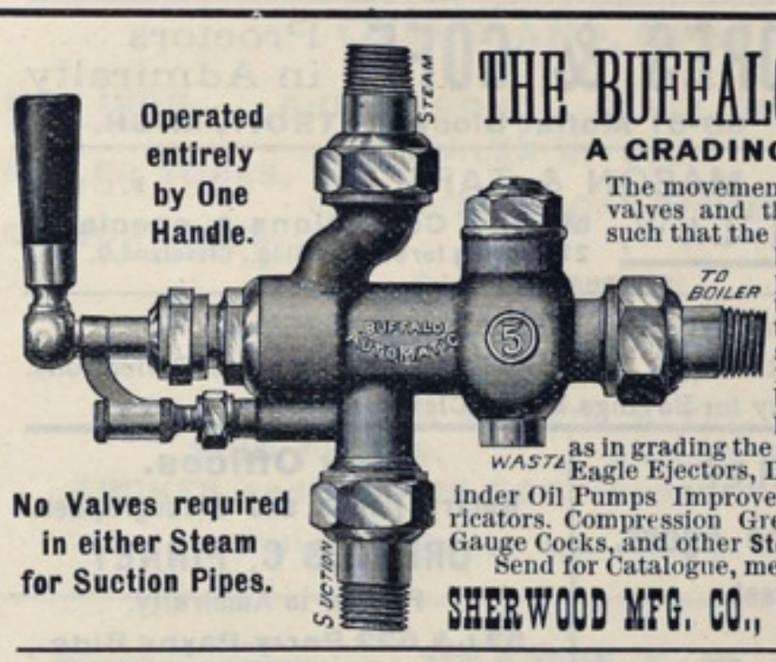

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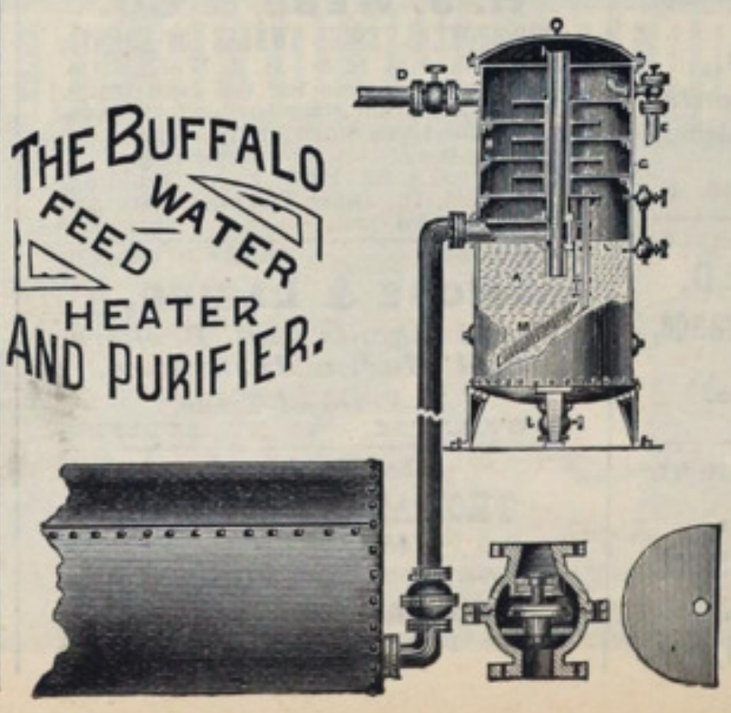

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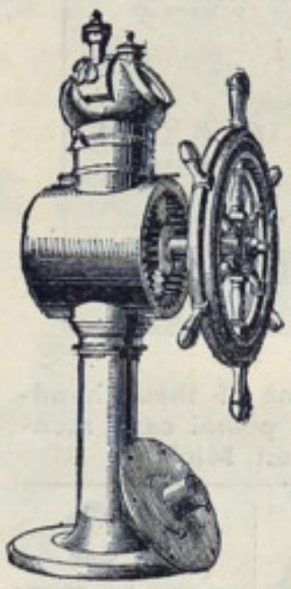

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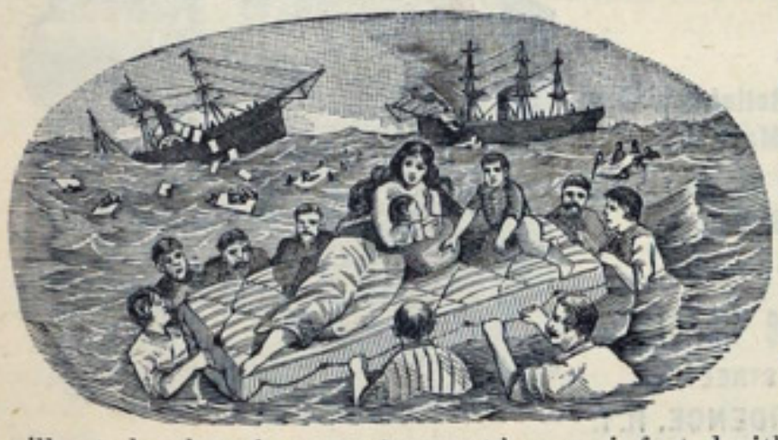

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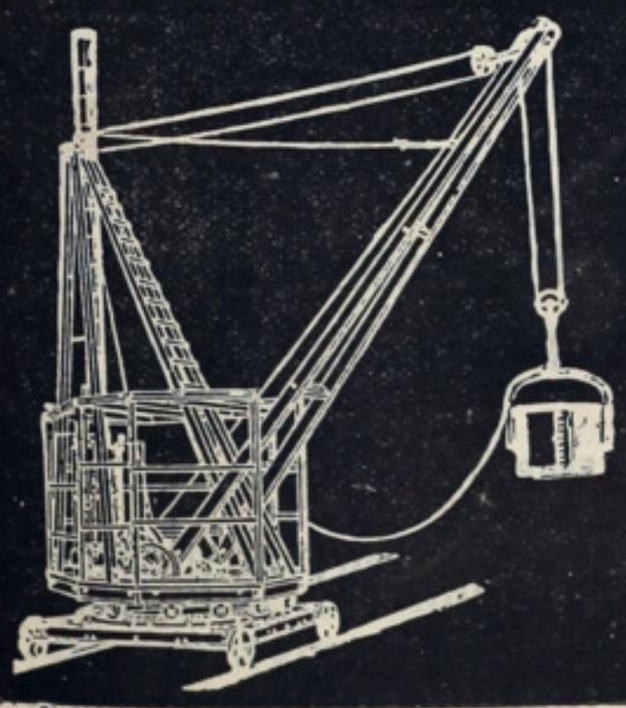

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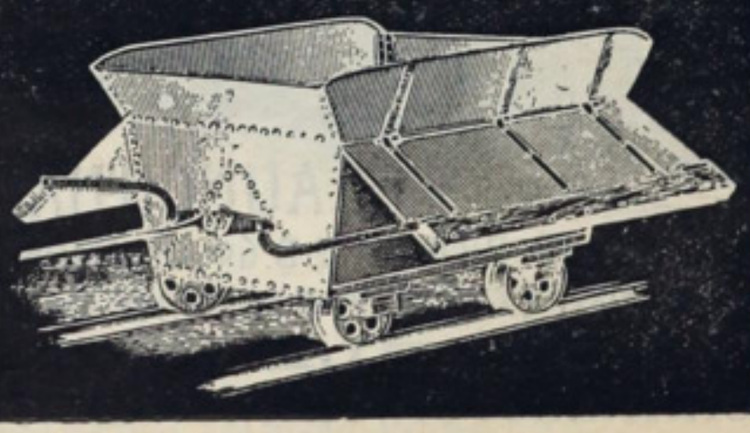

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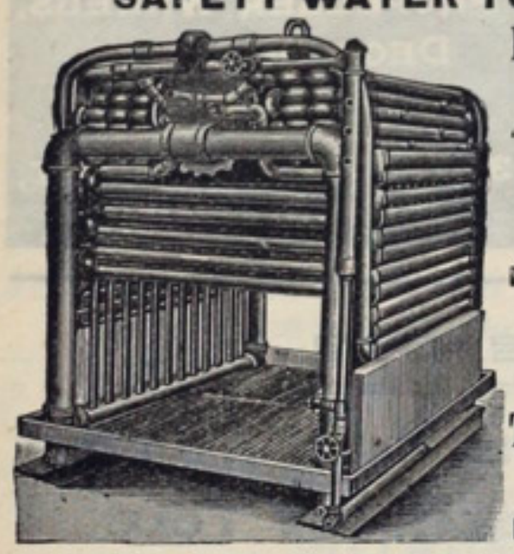

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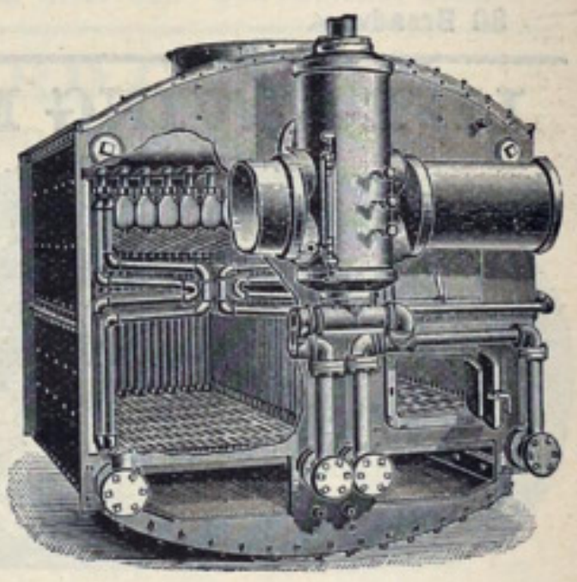

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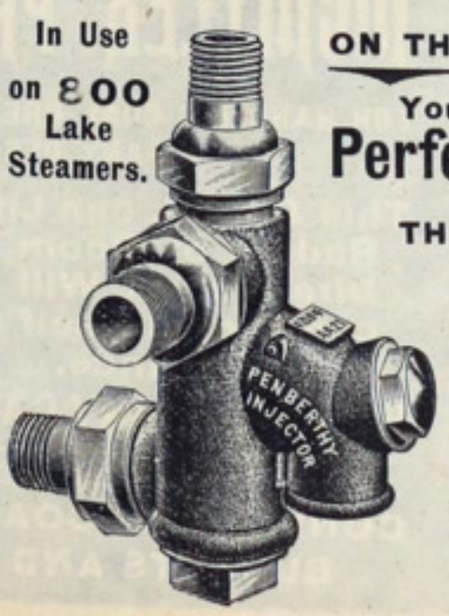

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